

New Hampshire Department of Environmental Services

**RESPONSE TO PUBLIC COMMENT
AND
SUMMARY OF SUBSTANTIVE DIFFERENCES BETWEEN THE DRAFT AND FINAL
2006 SECTION 303 (D) SURFACE WATER QUALITY REPORT**

3/31/06

On February 23, 2006, the New Hampshire Department of Environmental Services (DES) released the draft Section 303(d) List of impaired waters for public comment. Downloadable copies of the draft list were made available on the DES website for review (www.des.state.nh.us/wmb/swqa/). In addition, the following organizations/agencies were notified by email:

Appalachian Mountain Club
Audubon Society
Connecticut River Joint Commissions
Conservation Law Foundation
County Conservation Districts
Lake and River Local Management Advisory Committees
Maine Department of Environmental Protection
Manchester Conservation Commission
Massachusetts Department of Environmental Protection
Merrimack River Watershed Council
National Park Service
New England Interstate Water Pollution Control Commission
NH Department of Health and Human Services
NH Coastal Program
NH Rivers Council
North Country Council
Regional Planning Commissions
Society for the Protection of National Forests
Natural Resources Conservation Service
The Nature Conservancy
Upper Merrimack River Local Advisory Committee
US Environmental Protection Agency
US Geological Survey
US Fish and Wildlife Service
US Forest Service
University of New Hampshire
Vermont Department of Environmental Conservation
Volunteer Lakes Assessment Program
Volunteer Rivers Assessment Program
Water Quality Standards Advisory Committee

The public comment period ended on March 23, 2006. The following represents DES's response to public comments received during this period and a summary of substantive differences between the draft and final Section 303(d) List.

A. RESPONSE TO PUBLIC COMMENT

Kirsten N. Ryan, P.G., Principal Scientist, S E A Consultants Inc., on behalf of the Town of Salem

COMMENT # 1:

On behalf of the Town of Salem, S E A Consultants Inc., hereby submits for your consideration comments and data on the Draft 2006 303(d) List of Impaired Waters with Respect to Canobie Lake. On the Draft 2006 303(d) list, Canobie Lake has been listed as marginally impaired (category 5-M) for Aquatic Life Use Support due to low pH Levels.

The Comments and data submitted will demonstrate that, based on the 2006 Consolidated Assessment and Listing Methodology (CALM), Canobie Lake should be removed from the 303(d) list for impairment with respect to pH for Aquatic Life.

Evidence for Support of Aquatic Life Designated Use

According to the 2006 CALM, a waterbody will be listed as impaired according to the "10% Rule", which in general states that at least 10% of samples must violate water quality standards before a water body will be listed as impaired. Specifically, for Aquatic Life Use to be Fully Supported, and the sample size is greater than 10, then the 10% rule must be met, and no more than one violation of the Magnitude of Exceedance Criteria (MAGEXC) is allowed. For pH, Aquatic Life, the MAGEXC is a pH less than 5.5 or greater than pH 9.

We have submitted 454 pH sample measurements, which represent 279 independent sample points, for upload to the NHDES Environmental Monitoring Database (EMD). The full dataset has been submitted electronically to Andrew Cornwell at NHDES. When combined with the existing data in the EMD that we are aware of, there are 10 total water quality violations (3.5%) and no MAGEXC violations. Therefore, Canobie Lake is not impaired with respect to pH for the 2006 reporting period.

Additional Comments Related to pH

- The current pH water quality standard lower limit of 6.5 appears to be too strict. NHDES's own analysis of naturally occurring pH indicated that the 75th percentile of reference lakes was 6.5.
- The CALM should be modified to account for the fact that due to the natural decrease in dissolved oxygen with depth in stratified lakes, there is a natural decrease in pH. The CALM uses only the worst case value for a given sampling station and a given sampling day. Therefore, for sampling efforts that measure pH at multiple depths, a single reading near the bottom of the epilimnion can falsely flag the entire water column as Impaired.

DES RESPONSE #1:

The department appreciates the additional pH data and supporting metadata that was submitted March 16th 2006 for Canobie Lake. The submitted data was found to be of sufficient quality for inclusion in the assessment process. After review of all of the data there were found to be 287 independent samples of which 11 (3.8 percent) were less than 6.5 and none were less than the pH magnitude of exceedence criteria of 5.5. Based on the additional data, and in accordance with the 2006 CALM, the Assessment Unit for Canobie Lake is considered fully supporting for pH (i.e., category 2-M which means it marginally meets the pH criteria). Consequently, unlike the Draft 303(d) List, the Final 303(d) List does not show Canobie Lake as being impaired for pH. .

New Hampshire's pH criteria of 6.5 is based upon the EPA "Redbook"¹. The Redbook cites studies to determine the chronic pH effects on the behavior and physiological condition in fish and the production and hatch success of fish eggs. The Redbook also references bioassays to determine the effect of pH on invertebrates. Based on these, and other tests, the Redbook concludes that;

"Based on present evidence, a pH range of 6.5 to 9.0 appears to provide adequate protection for the life of freshwater fish and bottom dwelling invertebrate fish food organisms. Outside of this range, fish suffer adverse physiological effects increasing in the severity as the degree of deviation increases until lethal levels are reached."

Consequently, New Hampshire's pH standard of 6.5 to 8.0 is considered reasonable and necessary to protect aquatic life. This is further substantiated by the fact that five of the six New England States also have a minimum pH criterion of 6.5.

With regards to the relationship between the 6.5 pH criterion and "natural" pH levels, it is well documented that New Hampshire surface waters are impacted to varying degrees by acid deposition (i.e., acid rain). It is also well established that New Hampshire's geology provides little buffering capacity to counter the effects of acid deposition. Consequently, it comes as little surprise that as more current data is collected more sites with low pH are revealed. The "reference lakes" used by the department to determine "naturally occurring" values for various parameters in lakes, were selected from watersheds that were considered to be minimally disturbed by humans. That is, the term "reference lake" refers to the amount of development within a lake's watershed and does not mean that a lake is free from atmospherically-deposited pollutants. It was not possible to exclude atmospheric deposition in the selection process since it occurs everywhere (although not uniformly). Consequently, it is not surprising that the 75th percentile pH value of the reference lakes wasn't higher than 6.5.

It is interesting to note that the reference lakes mentioned above, were generally more acidic than the non-reference lakes. The more acidic nature of the "reference lakes" implies that

¹ Quality Criteria for Water. United States Environmental Protection Agency. EPA-440/9-76-023. 1976.

while all the lakes receive acidic inputs from atmospheric deposition, the non-reference lakes may also receive materials in the runoff from developed areas that, to some extent, add to the acid neutralizing capacity (ANC) of the lake and help counteract the acidic inputs. Data indicates that some New Hampshire urban ponds, which are subjected to stormwater runoff from developed areas, tend to have some of the higher ANC and pH values of all the state's lakes. This is not to suggest, however, that urban stormwater runoff provides an overall water quality benefit as there are typically many other pollutants in stormwater runoff which can adversely impact aquatic life or other uses.

With regards to the second comment, the pH criteria (Env-Ws 1703.18) do not specify a time, place, or duration as to when they apply. This is interpreted to mean that the criteria must be met at all times and all places. Consequently, the use of the worse case value, no matter where it is taken from in the waterbody, is appropriate for determining compliance with the pH criteria. If the worse case value meets the criteria we can be confident that all other locations meet the criteria. Per the CALM, at least 10 percent of all independent samples (with a minimum of 2) must exceed the pH criterion to be considered an impairment. A single pH value will not be used to determine impairment as suggested.

The department acknowledges that there are typically seasonal swings in pH with a minimum in spring (March/April) and maximum in late summer (August/September). In highly productive systems there can be a diurnal pH swing with a minimum in early morning when respiration exceeds photosynthesis and maximum in early afternoon when photosynthesis exceeds respiration. Preliminary analyses to date suggest that greater than 90% of stratified New Hampshire lakes have a lower pH in the hypolimnion than the epilimnion. The seasonal, diurnal, and pH differences with depth taken in conjunction with the biological need for the criteria to be met at all times and all places suggests that, in the future, it may be appropriate to specify "critical period" conditions that need to be satisfied in order for a waterbody to be considered Fully Supporting the pH criteria. This will likely be a topic of discussion in future versions of the CALM. Prior to making any changes to the CALM, opportunity for public comment will be provided.

Bill Schroeder, Vice-president Canobie Lake Protective Association, on behalf of the Canobie Lake Protective Association

COMMENT #2:

The Canobie Lake Protective Association would like to submit the following comment on the Draft 2006, 303(d) List of Impaired Surface Waters for New Hampshire.

We are troubled that Canobie Lake has been dropped from the list of impaired surface waters. It was listed in 2004. We understand the reason is that you have changed your criteria, and the fact that Canobie Lake has been treated several times in the past decade with copper sulfate to kill excess algae growth, is no longer a reason for listing.

We believe this change in criteria is a mistake. We believe it results from lobbying by municipal water authorities who do not want their customers to hear that their water source is an "impaired waterbody".

We believe when chemical treatments are needed to kill algae, or seaweed, or any other organisms, **the waterbody is impaired**. Steps should be taken to reverse the impairment, or limit further degradation. When the waterbody is declared to be impaired it focuses attention on the issue. It permits the town, or the state to take appropriate action. Conversely, when it's not considered to be impaired it's very hard to get the government to do anything.

In the case of Canobie Lake, we have been told by NHDES officials, that the most likely cause of excessive algae is phosphorus in the water. The town of Salem and the state could require that only low-phosphorus fertilizer be used in the watershed, and limit the addition of impervious surfaces (pavement). But now they won't have to, because the lake is officially "no longer impaired".

We urge you to continue to use the same criteria you did in 2004.

DES RESPONSE #2:

According to RSA 485-A:8, I and II, Class A and B surface waters shall be "... acceptable for water supply uses after adequate treatment". The statute does not state that such waters shall be acceptable for water supply uses after conventional treatment, as implied in the 2004 CALM. Copper sulfate is a relatively common form of treatment used by many water suppliers to control taste and odor problems and, therefore, meets the definition of "adequate treatment" necessary to make waters acceptable for water supply uses. Consequently, use of copper sulfate to control taste and odor problems in water supplies is not considered a violation of water quality standards. As such, use of copper sulfate to control taste and odor problems has been removed as an indicator of impairment for the drinking water use in the 2006 CALM.

Tom Irwin, Staff Attorney on behalf of the Conservation Law Foundation

COMMENT #3:

I am writing on behalf of the Conservation Law Foundation relative to the draft 2006 303(d) list. In particular, I am writing to comment on the Department of Environmental Services' (DES) draft decision to de-list the following water bodies:

- Penacook Lake, Concord (NHLAK7000060302-09)
- Harris Pond/Pennichuck Brook (NHLAK700061001-04-01)
- Bowers Pond (NHLAK700061001-04-02)
- Canobie Lake (NHLAK700061102-02)

Each of the above waters has been listed on the 303(d) list for impairments caused by “Excess Algal Growth.” DES now proposes de-listing these waters on the ground that it no longer views the use of copper sulfate, for treatment purposes, to warrant listing. We object to the de-listing of these waters.

DES’s decision to de-list the above waters is premised on its changed view relative to the use of copper sulfate for treatment. This analysis misses the mark. The fact that a waterbody *requires* treatment, rather than DES’s characterization of the *treatment method*, is the proper determining factor in whether a water body should be listed as impaired on the 303(d) list. In other words, the excessive algae in the above water bodies – rather than DES’s view of the method for treating associated taste and odor problems – requires continued listing of these waters.

The 303(d) list is a critically important tool for remedying the causes of water-body impairments. In the case of the above waters, the excess algal growth is likely related to nutrient loadings. Removing these waters from the list eliminates an important and necessary impetus for addressing the nutrient loadings which are causing the excess algal growth. De-listing these waters on the simple basis that the *symptoms* of excessive nutrient inputs and algal growth can be treated is an ill-conceived decision that completely ignores the importance of watershed-based planning.

We urge DES to return the above-listed waters to the 303(d) list.

DES RESPONSE #3:

See DES RESPONSE #2.

James J. Donison, P.E., Superintendent, Concord Water Treatment Plant, on behalf of the City of Concord

COMMENT #4:

This letter is a follow up to our previous request to remove the Penacook Lake from the draft 2006, 303(d) list of impaired water bodies in the state.

As per your request for additional information, the following information is being submitted to complement our previous submitted information.

1. QA/QC data including meter used, accuracy, duplicates and standard operating procedures.
2. All pH water data represents the untreated Penacook lake water at the intake to the water treatment plant. Mr. Paul Currier of your office eluded that the two sole data points that you had to base your initial impaired classification on, were based upon water in the lake profile at various depths. We do not have this varying depth water quality information as we only take water samples for water entering the WTP.
3. I will also email you the daily pH data on an excel spreadsheet as it will print out at over 100 pages of data. If you require hard copies of this data please let me know and I will

prepare them for you. The data represents the period from January 1, 2002 through March 27, 2006 and includes 3790 raw water pH data points.

Of the 3790 pH data points 94.1% were for a pH of 6.50 or greater. Only 225 data points or 4.9% were less than a pH of 6.5. This information represents that the Penacook Lake water quality meets the non-impaired water quality criteria rules.

Please call if you have any questions, comments or require additional information. The Penacook Lake is the primary water supply to the City of Concord and we want to ensure that it is not listed as an impaired water body. The lake and watershed is very well protected. It is representative of New Hampshire lakes in their natural state in the 21st century. Classifying the lake as impaired based upon two data points is not a responsible scientific analysis and we will take exception to your continuing to classify the lake as impaired if you do not accept the information as submitted.

DES RESPONSE #4:

The department appreciates the additional data with supporting metadata that was submitted March 28th 2006. The submitted data was found to be of sufficient quality for inclusion in the assessment process. After review of all of the data there were found to be 1539 independent samples of which 125 (8.1 percent) were less than 6.5 and none were less than the pH magnitude of exceedence criteria of 5.5. Based on the additional data, and in accordance with the 2006 CALM, the Assessment Unit for Penacook Lake is considered fully supporting for pH (i.e., category 2-M which means it marginally meets the pH criteria). Consequently, unlike the Draft 303(d) List, the Final 303(d) List does not show Penacook Lake as being impaired for pH.

With regards to the statement “It is representative of New Hampshire lakes in their natural state in the 21st century” the department agrees that the pH levels in Penacook Lake appear to be typical of many other New Hampshire lakes. However, to determine if low pH is due primarily to natural conditions or to other anthropogenic impacts such as acid rain, color measurements are needed per the CALM. In general, the CALM states that in the absence of other sources that could significantly impact pH, low pH exceedences in waters with apparent color measurements greater than 30 cpu are considered to be primarily due to natural sources such as tannic and humic acids in the water. Consequently the CALM does include a method for determining if low pH is primarily due to natural conditions, however to make this determination additional data is needed. Without such data, one cannot defensibly conclude that low pH is due to natural conditions.

With regards to the statement “Classifying the lake as impaired based upon two data points is not a responsible scientific analysis ...”, the department disagrees. As discussed in DES RESPONSE #1, the pH standard must be met at all times and all places. Based on this some would argue that even one sample exceeding that criteria should be sufficient to list a waterbody as impaired. The CALM, however, does not allow this; in fact a basic premise of the CALM is that an assessment decision will not be made on only one data point. To address situations where samples violate pH criterion but not by large amounts (i.e., values

are within the accuracy of sampling and method of analysis), the department applies the 10% rule. In general this means that at least 10% of the independent samples (with a minimum of two samples) must exceed the pH criterion before a water will be assessed as impaired. In other words the 10% rule is an attempt to account for small excursions which may be due to measurement error. If less than 10% of the samples violate standards, the excursions are attributed to measurement error. If, however, 10% or more of the samples violate standards, the excursions are not considered to be due to measurement error alone and actual instream violations are concluded to exist. To capture gross exceedances of water quality criterion that are representative of violations in the waterbody and cannot be attributed to measurement error, the CALM includes magnitude of exceedance (MAGEX) criteria. For pH, the MAGEX criteria are pH less than 5.5 or pH greater than 9.0. For toxics, MAGEX criterion are set at twice the acute water quality criterion. Regardless of the total number of samples, a water may be listed as impaired if two or more samples exceed the MAGEX criteria. All of the above assumes that the data has been checked for quality assurance and quality control.

In conclusion, the department believes that the above approach is reasonable, is in compliance with New Hampshire's surface water quality regulations, and is protective of water quality and the designated uses of State surface waters.

B. SUMMARY OF SUBSTANTIVE DIFFERENCES BETWEEN THE DRAFT AND FINAL 2006 SECTION 303(D) LIST OF IMPAIRED SURFACE WATERS

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHEST600031004-03-01	TIDE MILL CREEK 1	Aquatic Life	Copper	4B-T	3/29/2006 4B-M --> 4B-T The Hampton WWTF is considered to be in "significant noncompliance" with the copper standard in its NPDES permit.
NHEST600031004-06	HUNTS ISLAND CREEK	Primary Contact Recreation	Enterococcus	3-ND	3/29/2006, Although the parameter is likely covered by the Hampton Harbor TMDL, the TMDL was for Fecal Coliform not Enterococcus. Further there is no in water data for the parameter so 4A --> 3-ND.
NHEST600031004-07	MILL CREEK	Primary Contact Recreation	Enterococcus	3-PAS	3/29/2006, Although the parameter is likely covered by the Hampton Harbor TMDL, the TMDL was for Fecal Coliform not Enterococcus. Further there is limited in water data for the parameter so 4A --> 3-PAS.
NHEST600031004-08-03	BLACKWATER RIVER	Primary Contact Recreation	Enterococcus	3-PAS	3/29/2006, Although the parameter is likely covered by the Hampton Harbor TMDL, the TMDL was for Fecal Coliform not Enterococcus. Further there is limited in water data for the parameter so 4A --> 3-PAS.
NHIMP700030104-04	CONTOOCOOK RIVER - NOONE MILL POND	Primary Contact Recreation	Chlorophyll-a	5-T	3/29/2006, 3-PNS --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-04	CONTOOCOOK RIVER - NOONE MILL POND	Aquatic Life	Phosphorus (Total)	5-T	Added 3/29/2006, 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-04	CONTOOCOOK RIVER - NOONE MILL POND	Primary Contact Recreation	Phosphorus (Total)	5-T	Added 3/29/2006. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions..
NHIMP700030104-04	CONTOOCOOK RIVER - NOONE MILL POND	Aquatic Life	Oxygen, Dissolved	5-T	3/29/2006, 3-PAS --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-04	CONTOOCOOK RIVER - NOONE MILL POND	Aquatic Life	Dissolved oxygen saturation	5-T	3/29/2006, 2-G --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-08	CONTOOCOOK RIVER - TRANSCRIPT PRINTING CO DAM	Primary Contact Recreation	Chlorophyll-a	5-T	Added 3/29/2006. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-08	CONTOOCOOK RIVER - TRANSCRIPT PRINTING CO DAM	Aquatic Life	Phosphorus (Total)	5-T	Added 3/29/2006. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a calibrated QUALE2E model under existing WWTF loading conditions

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHIMP700030104-08	CONTOOCOOK RIVER - TRANSCRIPT PRINTING CO DAM	Aquatic Life	Oxygen, Dissolved	5-T	Added 3/29/2006. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-08	CONTOOCOOK RIVER - TRANSCRIPT PRINTING CO DAM	Aquatic Life	Dissolved oxygen saturation	5-T	Added 3/29/2006. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-08	CONTOOCOOK RIVER - TRANSCRIPT PRINTING CO DAM	Primary Contact Recreation	Phosphorus (Total)	5-T	Added 3/29/2006. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-12	CONTOOCOOK RIVER - NORTH VILLAGE DAM	Primary Contact Recreation	Chlorophyll-a	5-T	3/29/2006, 3-PAS --> 5-T. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-12	CONTOOCOOK RIVER - NORTH VILLAGE DAM	Aquatic Life	Phosphorus (Total)	5-T	Added 3/29/2006. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-12	CONTOOCOOK RIVER - NORTH VILLAGE DAM	Primary Contact Recreation	Phosphorus (Total)	5-T	Added 3/29/2006. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-12	CONTOOCOOK RIVER - NORTH VILLAGE DAM	Aquatic Life	Dissolved oxygen saturation	5-T	3/29/2006, 3-PAS --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHIMP700030104-12	CONTOOCOOK RIVER - NORTH VILLAGE DAM	Aquatic Life	Oxygen, Dissolved	5-T	3/29/2006, 3-PAS --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions..
NHIMP700030202-02	NORTH BRANCH - ROBB RESERVOIR	Aquatic Life	pH	2-OBS	3/29/2006, 5-P --> 2-OBS. Waterbody color > 30cpu. Not a delist since not on the 2004 303(d).
NHIMP801060405-11	SUGAR RIVER - SUGAR RIVER MILL	Aquatic Life	Oxygen, Dissolved	5-T	3/29/2006, 5-M --> 5-T. 2/3/04: DO based on calibrated model for Sugar River at future full design flow conditions. This should be Insufficient Information and Threatened instead of Not Supporting and Threatened for DO but ADB does not recognize impairments if Use is Insufficient Info and Threatened. Change back once this is fixed in program. No changes are necessary if there are other impairments for this use causing NS.

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHIMP801060406-08	SUGAR RIVER	Aquatic Life	Oxygen, Dissolved	5-T	3/29/2006, 5-M --> 5-T. 2/3/04: DO based on calibrated model for Sugar River at future full design flow conditions. This should be Insufficient Information and Threatened instead of Not Supporting and Threatened for DO but ADB does not recognize impairments if Use is Insufficient Info and Threatened. Change back once this is fixed in program. No changes are necessary if there are other impairments for this use causing NS.
NHLAK700060302-09	PENACOOK LAKE	Aquatic Life	pH	2-M	3/29/2006, 5-M --> 2-M. Additional data with supporting metadata that was submitted March 28th 2006 on by the City of Concord Water Treatment Facility. This additional data indicated that the pH criteria is met. Not a delist since not on the 2004, 303(d) list.
NHLAK700061102-02	CANOBIE LAKE	Aquatic Life	pH	2-M	3/29/2006, 5-M --> 2-M. Additional data with supporting metadata that was submitted March 16th 2006 on behalf of the Town of Salem by S E A Consultants Inc. This additional data indicated that the pH criteria is met. Not a delist since not on the 2004 303(d) list.
NHLAK802010101-05	MAY POND	Aquatic Life	pH	4A-P	3/29/2006, 2-OBS --> 4A-P. General correction, the Acid Pond TMDL has been completed.
NHLAK802010303-04	ROCKWOOD POND	Aquatic Life	pH	4A-P	3/29/2006, 5-P --> 4A-P. TMDL done. DELIST to 4A. Accidentally missed for the Draft 303(d) list.
NHRIV600030805-02	EXETER RIVER	Primary Contact Recreation	Escherichia coli	5-P	3/29/2006, 2-M --> 5-P based upon original 2002 list data. 1998-1999 data from 12-EXT; 6/24/1998=210 cts/100mL, 7/27/1998=260 cts/100mL, 8/4/1998=450 cts/100mL, 8/28/1998=190 cts/100mL, 6/24/1999=190 cts/100mL, 8/2/1999=280 cts/100mL, 8/20/1999=370 cts/100mL, 6/20/2001=70 cts/100mL, 7/5/2001=60 cts/100mL, 7/25/2001=100 cts/100mL.
NHRIV600030901-02	WINNICUT RIVER - BARTON BROOK - MARSH BROOK - THOMPSON BROOK	Aquatic Life	Oxygen, Dissolved	5-P	Added 3/1/2006, 3-ND --> 5-P. Golf Club of New England 401 data
NHRIV600030901-02	WINNICUT RIVER - BARTON BROOK - MARSH BROOK - THOMPSON BROOK	Aquatic Life	pH	5-M	Added 3/1/2006, 3-ND --> 5-P. Golf Club of New England 401 data

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHRIV700010801-23	PEMIGEWASSET RIVER	Aquatic Life	Dissolved oxygen saturation	5-M	3/1/2006, 3-ND --> 5-M. March 23, 2001, Draft Water Quality Monitoring Report for Ayers Island: For 1997-2000 Daily average percent saturation was violated 10 of 22 times in the Upper part of the impoundment, 6 of 22 times in the Lower part of the impoundment, and 2 of 18 (Sept 1&2, 1999, 66 & 65% Daily average) times in the Tailrace of the impoundment (6 of 11 times for 1994-1996). DES Ambient Data: Only two samples of upper layers DO data in impoundment (meeting standards). No downstream data.
NHRIV700010803-13	PEMIGEWASSET RIVER	Aquatic Life	Dissolved oxygen saturation	2-G	3/01/2006, 5-M --> 2-G. DELIST - The data that was used to list this AU was for the tailrace of the Ayers Island Dam. The tailrace is AUID = NHRIV7000101801-23. The impairment has been moved to the correct AU.
NHRIV700030101-16	CONTOOCOOK RIVER	Primary Contact Recreation	Chlorophyll-a	5-T	3/22/2006, 3-PAS --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-16	CONTOOCOOK RIVER	Primary Contact Recreation	Phosphorus (Total)	5-T	3/22/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-17	CONTOOCOOK RIVER - TOWN FARM BROOK	Primary Contact Recreation	Chlorophyll-a	5-T	3/29/2006, 3-PAS --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-17	CONTOOCOOK RIVER - TOWN FARM BROOK	Aquatic Life	Phosphorus (Total)	5-T	3/29/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-17	CONTOOCOOK RIVER - TOWN FARM BROOK	Aquatic Life	Dissolved oxygen saturation	5-T	3/29/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-17	CONTOOCOOK RIVER - TOWN FARM BROOK	Aquatic Life	Oxygen, Dissolved	5-T	3/29/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030101-17	CONTOOCOOK RIVER - TOWN FARM BROOK	Primary Contact Recreation	Phosphorus (Total)	5-T	3/29/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-03	CONTOOCOOK RIVER - GRIDLEY RIVER	Primary Contact Recreation	Phosphorus (Total)	5-T	3/29/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 15ug/L criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHRIV700030104-03	CONTOOCOOK RIVER - GRIDLEY RIVER	Aquatic Life	Dissolved oxygen saturation	5-T	3/23/2006, 2-G --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions. The DO (mg/L) exceedence was also seen instream when river flow was in excess of critical low flow conditions.
NHRIV700030104-03	CONTOOCOOK RIVER - GRIDLEY RIVER	Aquatic Life	Oxygen, Dissolved	5-P	3/23/2006, Added Threatened Flag. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions... The DO (mg/L) exceedence was also seen instream when river flow was in excess of design conditions.
NHRIV700030104-03	CONTOOCOOK RIVER - GRIDLEY RIVER	Aquatic Life	Phosphorus (Total)	5-T	3/23/2006, 3-ND --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions. The DO (mg/L) exceedence was also seen instream when river flow was in excess of design conditions.
NHRIV700030104-03	CONTOOCOOK RIVER - GRIDLEY RIVER	Primary Contact Recreation	Chlorophyll-a	5-T	3/29/2006, 2-G --> 5-T. Chlorophyll a exceeds the 15ug/L criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-12	CONTOOCOOK RIVER	Primary Contact Recreation	Chlorophyll-a	5-T	3/23/2006, 3-PAS --> 5-T. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-12	CONTOOCOOK RIVER	Primary Contact Recreation	Phosphorus (Total)	5-T	3/23/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-12	CONTOOCOOK RIVER	Aquatic Life	Dissolved oxygen saturation	5-T	3/23/2006, 3-PND --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-12	CONTOOCOOK RIVER	Aquatic Life	Phosphorus (Total)	5-T	3/23/2006, 3-PND --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-12	CONTOOCOOK RIVER	Aquatic Life	Oxygen, Dissolved	5-T	3/23/2006, 3-PND --> 5-T. DO (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-16	CONTOOCOOK RIVER	Primary Contact Recreation	Chlorophyll-a	5-T	3/23/2006, 3-PAS --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-16	CONTOOCOOK RIVER	Aquatic Life	Dissolved oxygen saturation	5-T	3/23/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHRIV700030104-16	CONTOOCOOK RIVER	Primary Contact Recreation	Phosphorus (Total)	5-T	3/23/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30 ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-16	CONTOOCOOK RIVER	Aquatic Life	Oxygen, Dissolved	5-T	3/23/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-16	CONTOOCOOK RIVER	Aquatic Life	Phosphorus (Total)	5-T	3/23/2006, 3-ND --> 5-T. Dissolved oxygen (% saturation and mg/L) water quality standards criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-17	CONTOOCOOK RIVER	Primary Contact Recreation	Chlorophyll-a	5-T	3/23/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700030104-17	CONTOOCOOK RIVER	Primary Contact Recreation	Phosphorus (Total)	5-T	3/23/2006, 3-ND --> 5-T. Chlorophyll a exceeds the 30ug/L MAGEX criteria based upon a recently calibrated QUALE2E model under permitted WWTF loading conditions.
NHRIV700060906-18	SOUHEGAN RIVER	Aquatic Life	Copper	4B-T	3/23/2006 4B-M --> 4B-T. 2/3/04: COPPER SHOULD BE IMP CAT 4B. Based on exceedances of the Milford WWTF NPDES / state discharge permit limit for copper (not instream concentrations). NPDES / state discharge permits are enforceable. This is an NPDES compliance issue. ALUS is Insuf. Info and threatened. For this use support combination, ADB won't allow this pollutant to be assigned to 4B where it belongs. RTI has been notified and is working on the problem. For now, assign a Use Support of NS and change back to Insuf Info for ALUS (if there are no other parameters causing NS) when program problem is resolved.
NHRIV801060405-10	SUGAR RIVER	Aquatic Life	Oxygen, Dissolved	4B-T	3/23/2006 4B-M --> 4B-T. 2/3/04: DO based on calibrated model for Sugar River at future full design flow conditions. This should be Insufficient Information and Threatened instead of Not Supporting and Threatened for DO but ADB does not recognize impairments if Use is Insufficient Info and Threatened. Change back once this is fixed in program. No changes are necessary if there are other impairments for this use causing NS.
NHRIV801060405-29	SUGAR RIVER	Aquatic Life	Oxygen, Dissolved	4B-T	3/23/2006 4B-M --> 4B-T. 2/3/04: DO based on calibrated model for Sugar River at future full design flow conditions. This should be Insufficient Information and Threatened instead of Not Supporting and Threatened but ADB does not recognize impairments if Use is Insufficient Info and Threatened. Change back once this is fixed in program.

TABLE 1: PARAMETER LEVEL SUBSTANTIVE CHANGES MADE TO ASSESSMENT UNITS (AUs)					
Assessment Unit Id	Assessment Unit Name	Use Description	Impairment Name	DES Category	Parameter Comments
NHRIV801060407-16	SUGAR RIVER	Aquatic Life	Copper	4B-T	3/23/2006 4B-M --> 4B-T 2/3/04: Copper is 4B. Based on exceedances of the Claremont WWTF NPDES / state discharge permit limit for copper (not instream concentrations). NPDES / state discharge permits are enforceable. This is an NPDES compliance issue.
NHRIV802010401-15	ASHUELOT RIVER	Aquatic Life	Zinc	4B-T	3/23/2006 4B-M --> 4B-T. 2/4/2004 - ZINC - THREATENED - Based on exceedances of the Keene WWTF NPDES / state discharge permit limit for zinc (not instream concentrations). NPDES / state discharge permits are enforceable. This is an NPDES compliance issue.

TABLE 2: SUBSTANTIVE CHANGES MADE TO THE CONSOLIDATED ASSESSMENT AND LISTING METHODOLOGY (CALM)
Added DES Category 5-T to address situations where there are no measured (in waterbody) violations but a waterbody is threatened and must be included on Category 5 (i.e., the 303(d) list) as required by Section 303(d) of the CWA. This may occur where a calibrated model indicates water quality criteria are predicted to be exceeded under existing or permitted conditions
Added DES Category 4B-T to address situations where there are no measured (in waterbody) violations but a waterbody is threatened and solutions other than a TMDL are expected to abate the threat. This may occur where a WWTF is in significant non-compliance with its permit and modeling predicts water quality criteria may be exceeded under existing or permitted conditions. Since there is an enforceable document in place (the NPDES permit) a TMDL is not necessary.